Taking Care of Lighting Fixtures

Lighting on Naval Ships (DOD-HDBK-289) outlines the requirements for maintaining explosion-proof lighting fixtures (NAVSEA drawing No. 803-5184170). Unfortunately, Naval Safety Center surveyors find many ships' crews that do not follow these requirements. Here are the most frequent discrepancies reported during surveys:

➢ One or both lead gaskets (NSN 5330-01-046-0440) missing.

➢ Using incandescent light bulbs instead of 110-watt, 120-volt reflector-type lamps (NSN 6240-00-578-6820).

➢ Globe securing rings are loose and not sealed properly. (Use lead-wire seals, NSN 5340-00-292-0892.)

According to Mil-F-16377, ships' crews must use explosion-proof lighting fixtures in gasoline-hazard areas and compartments where gasoline vapors may occur. The fixtures also are required in spaces where paint is mixed and issued, and in storerooms containing flammable liquids and flammable-gas cylinders.

Appendix B (see figure 1) of DOD-HDBK-289 shows how to install explosion-proof lighting fixtures.

Point of Contact: MMCS(SW) L. L. Uy (Code 321)
DSN 564-6133

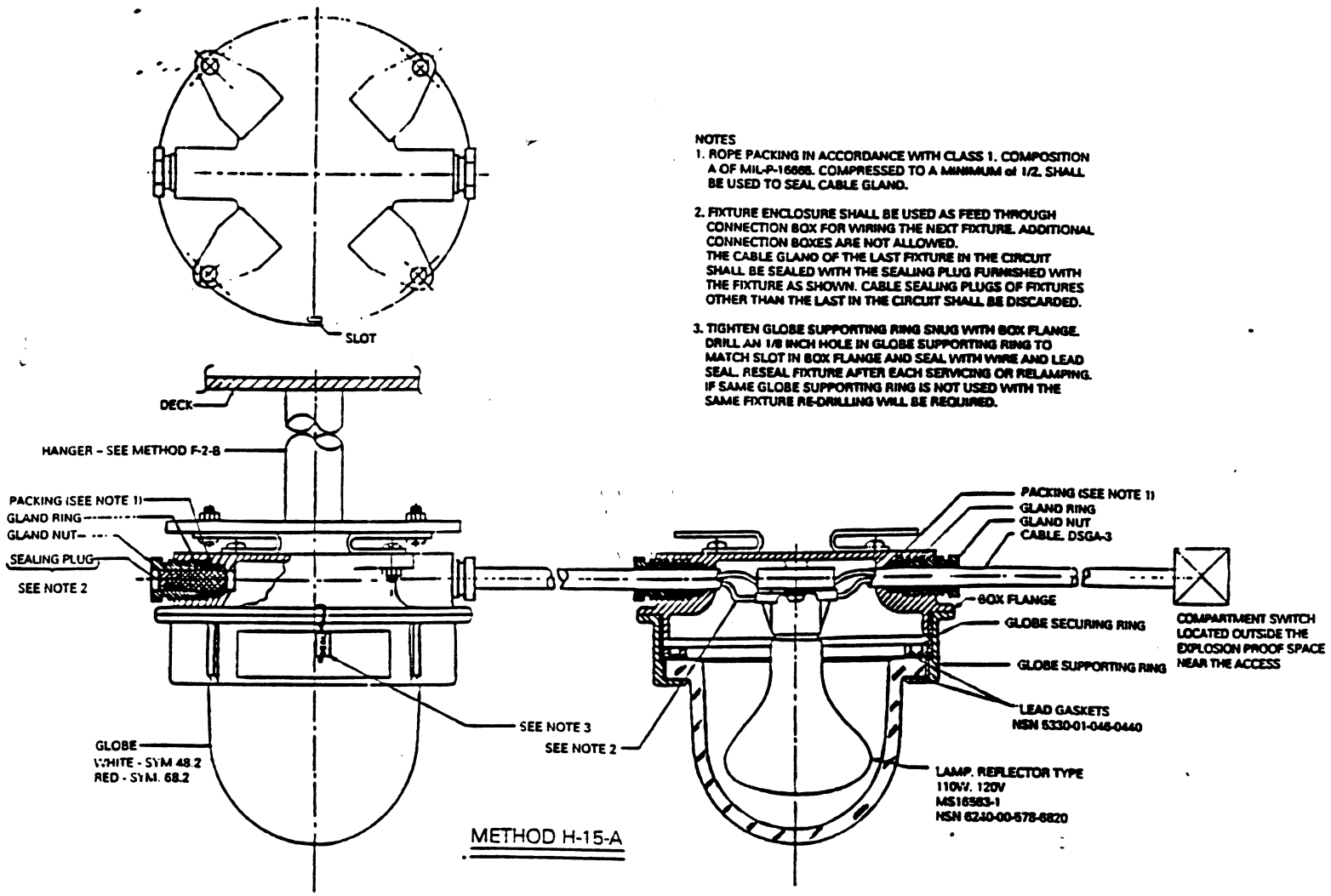


Fig. 1

ammable- liquid storerooms and paint-issue
s aboard ships. One recurring discrepancy is
e use of incandescent lamps in explosion-proof
tures.

Incandescent lamps are the most common light
urces aboard ship. Electricity heats a tungsten or
rbon filament, which supplies the light source.
eneral lighting consists of 200-watt, 120-watt,
0-watt, 75-watt and 50-watt bulbs.

These types of bulbs are not authorized for use
explosion-proof fixtures. Yet, these bulbs are
ing used in flammable storerooms and paint-
sue rooms on a large number of ships. Standard
ht bulbs generate high temperatures that create
potentially explosive atmosphere.

A standard 100-watt bulb produces considerable
at (figure 1). The surface temperature of the bulb
d average heat output is significantly higher if
e bulb is in an enclosed fixture, such as an
plosion-proof fixture. Heat generated by the bulb
pends on three factors: bulb size (wattage),
ape, and position (angle) of installation.

A group "D" explosion-proof fixture can with-
and an explosion within the fixture and prevent
ission of sparks, flashes, flames, or hot particles
at could ignite surrounding flammable or com-
ble products. Group "D" explosion-proof
es are required in all flammable storerooms
d paint issue rooms. These fixtures are installed
accordance with NAVSEA drawing 803-5184170,
hich is included in "Lighting on Naval Ships
andbook," DOD-HDBK-289(SH).

You must follow these requirements when in-
alling explosion-proof fixtures:

(1) Only use reflector-type lamps. NSN 6240-00-
8-6820 (figure 2).

(2) Install a lead gasket (NSN 5330-01-046-0440)
etween the globe-supporting ring and the globe-
curing ring.

(3) Tighten the globe-supporting ring and lock it
place with a lead wire seal. Redrill the support-
g ring using a 1/8-inch drill bit if you need to
atch the slot in the box flange.

(4) Use a white-globe fixture (NSN 6210-00-237-
775). You may use red-globe fixtures in areas
here they are required.

(5) Make sure identification and warning plates
re on the fixture. Identification label plates must
e at least 4-inches long and 1-inch wide. The label
ze is the same for all three information plates.
he labels should contain the following informa-
o:

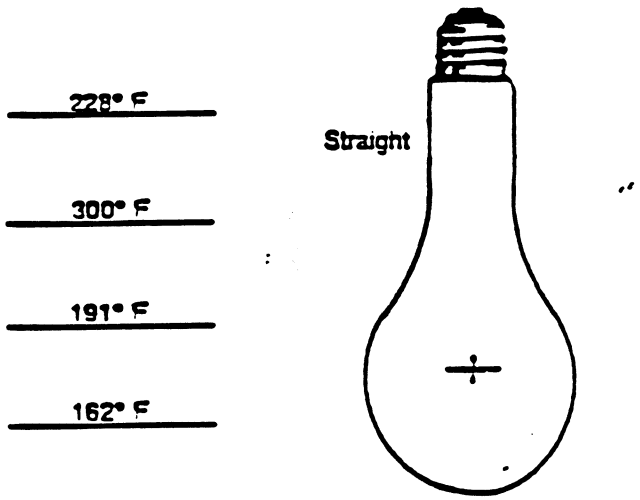
(a) Use the following repair parts only. Lead
asket: NSN 5330-01-046-0440. Red globe: NSN
237-8775. Lamp NSN 6240-00-578-6821. Body:
NSN 6210-00-500-2550.

(b) MIL-F-16377/25, symbol 48.2 - white,
(symbol 68.2 - red) explosion-proof fixtures for use
in the following explosive atmospheres: gasoline,
petroleum, naphtha, alcohol, lacquer solvent va-
pors, and natural gas, manufacturer's name.

(c) Tighten globe-supporting ring snug with bo
flange. Drill an 1/8-inch hole in globe-supporting
ring to match slot in box flange and seal with wire
and lead seal. Reseal fixture after servicing or
repairing. If same globe-supporting ring is not usec
with the same fixture, re-drilling will be required.

Because of the requirements concerning the
relamping of explosion-proof fixtures, only a quali-
fied electrician should change bulbs and maintain
the fixtures. Maintenance personnel should contac
the duty electrician to change bulbs in a flammable
storeroom or paint-issue room.

Point of Contact: Mr. Thomas Priesman
Autovon (DSN): 564-6133



Heat output is based on installed position of bulb in fixture.

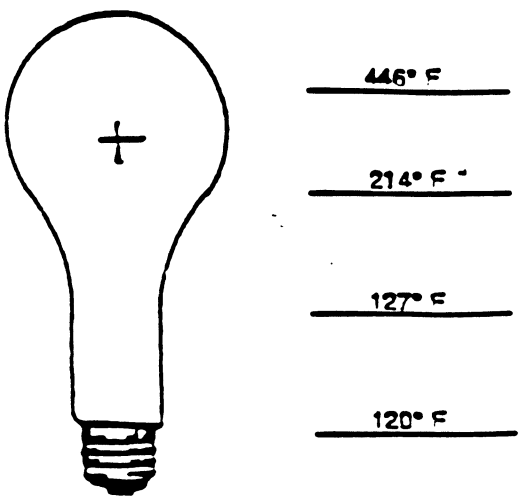


Figure 1. 100 Watt Bulb

SHIP SYSTEM, SYSTEM, SUBSYSTEM, OR EQUIPMENT	REFERENCE PUBLICATIONS	DATE
Explosion-Proof Lighting Fixtures		October 1997

TEST	OTHER	SYSCOM MRC CONTROL NO.	MAINTENANCE REQUIREMENT DESCRIPTION	PERIODICITY CODE	RATES	MAN HOURS	RELATED MAINTENANCE
		A7 9HKT N	1. Visually inspect explosion-proof lighting fixtures.	S-1	PO3	0.2	None
		A7 9HKU N	1. Inspect/repair explosion-proof lighting fixtures. **NOTE:** Accomplish every 18 months and when inspection reveals damaged or inoperable fixtures.	18M-1R	PO3	0.5	None
			INACTIVE EQUIPMENT MAINTENANCE				
			The following requirements will be scheduled when equipment is inactivated for periods of prolonged idleness. None required				

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SHIP SYSTEM	SUBSYSTEM	MRC CODE
Elect. Plant General 300	Lighting Distribution 331	3301 S-1

SYSTEM	EQUIPMENT	RATES	M/H
Lighting Systems 330	Explosion-Proof Lighting Fixtures	PO3	0.2

MAINTENANCE REQUIREMENT DESCRIPTION
1. Visually inspect explosion-proof lighting fixtures.

TOTAL M/H 0.2
ELAPSED TIME 0.2

SAFETY PRECAUTIONS
1. Forces afloat comply with NAVOSH Program Manual for Forces Afloat, OPNAVINST 5100.19 series.
2. Ensure all tag-out procedures are in accordance with current shipboard instructions.
3. Exercise caution when lighting is secured.

TOOLS, PARTS, MATERIALS, TEST EQUIPMENT

MATERIALS
1. [1144] Tag, safety
2. [2277] Pad, writing paper
3. [2278] Pencil

TOOLS
1. [2271] Flashlight, Type 3, style 1, explosive proof

MISCELLANEOUS
1. [2676] Stepladder, No NSN -- W/C provide

NOTE: Numbers in brackets can be referenced to Standard PMS Materials Identification Guide (SPMIG) for stock number identification.

PAGE 1 OF 3

PROCEDURE
1. **Visually Inspect Explosion-Proof Lighting Fixtures.**
   a. Energize lighting system, if applicable. Note any explosion-proof fixtures that are not illuminated.

WARNING: Ensure all tag-out procedures are in accordance with current shipboard instructions.

   b. De-energize lighting system and tag "Out of Service."

NOTE 1: Refer to figure 1 for parts identification and location.

WARNING: Exercise caution when lighting is secured.

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A7 9HKT N

LOCATION	DATE
Equipment Guide List Recommended	October 1997

SHIP SYSTEM, SYSTEM, SUBSYSTEM, OR EQUIPMENT	REFERENCE PUBLICATIONS	DATE
Explosion-Proof Lighting Fixtures		October 1997

TEST	OTHER	SYSCOM MRC CONTROL NO.	MAINTENANCE REQUIREMENT DESCRIPTION	PERIO-DICITY CODE	RATES	MAN HOURS	RELATED MAINT-ENANCE
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		A7 9HKU N	1. Inspect/repair explosion-proof lighting fixtures. **NOTE:** Accomplish every 18 months and when inspection reveals damaged or inoperable fixtures.	18M-1R	PO3	0.5	None
			INACTIVE EQUIPMENT MAINTENANCE				
			The following requirements will be scheduled when equipment is inactivated for periods of prolonged idleness. None required				

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SYSTEM	EQUIPMENT	RATES	M/H
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TOTAL M/H 0.2
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MAINTENANCE REQUIREMENT DESCRIPTION
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MATERIALS
1. [1144] Tag, safety
2. [2277] Pad, writing paper
3. [2278] Pencil

MISCELLANEOUS
1. [2676] Stepladder, No NSN -- W/C provide

TOOLS
1. [2271] Flashlight, Type 3, style 1, explosive proof

NOTE: Numbers in brackets can be referenced to Standard PMS Materials Identification Guide (SPMIG) for stock number identification.

PROCEDURE
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LOCATION	DATE
Equipment Guide List Recommended	October 1997

PROCEDURE (Contd)

c. Inspect for:
   (1) Loose or missing globe support rings and globe securing rings.
   (2) Missing lead wire seals.
   (3) Damaged or discolored globe covers.
   (4) Defective or damaged sealing plugs and gland nuts.

NOTE 2: All corrective maintenance required for explosive-proof light fixtures is to be accomplished by qualified electrical work center personnel only.

d. Remove safety tag; return system to required readiness condition.

9HKT

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PROCEDURE (Contd)

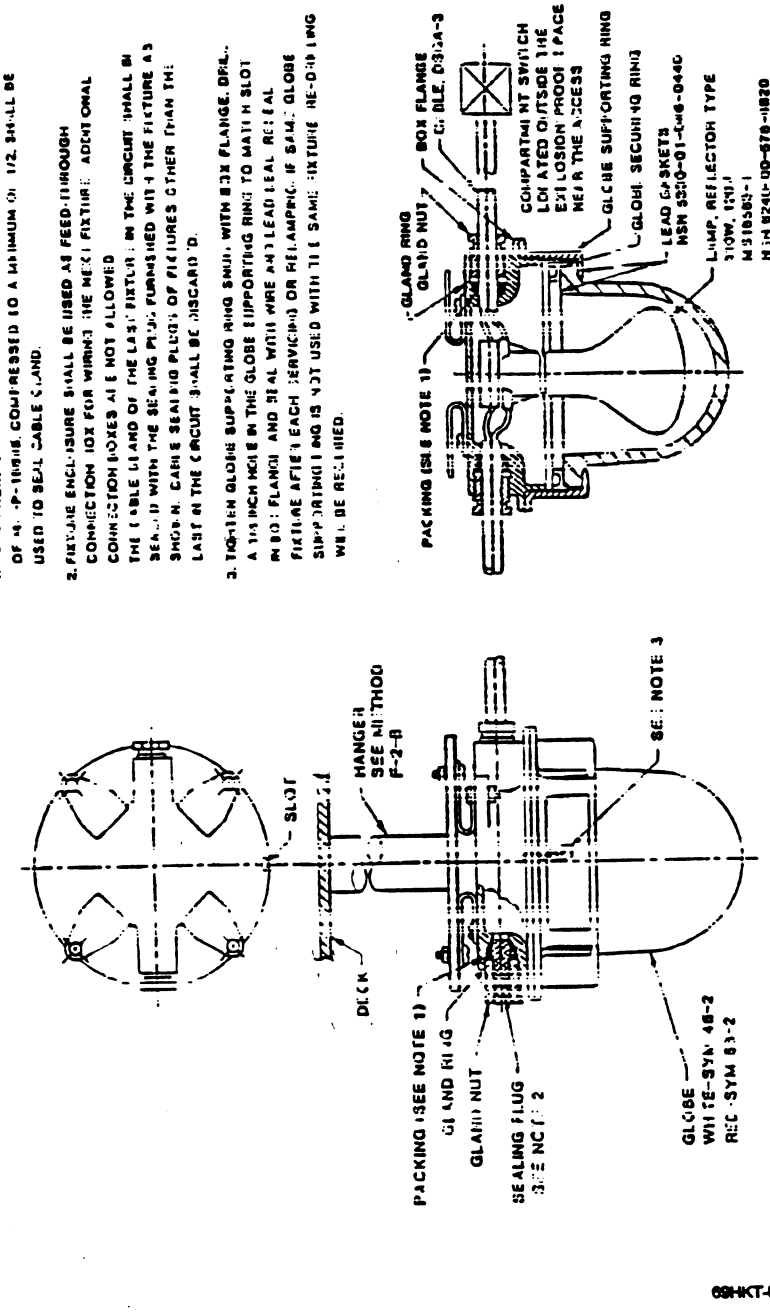

Figure 1